

CLAIMS

What is claimed is:

1. In a network comprising a plurality of segments and at least a first and a second node, the first and second nodes each being included in different respective segments of the plurality of segments, a method of facilitating communication between nodes on different segments of a network, the method comprising:

at a computer in communication with the first and second nodes via the respective segments in which the first and second nodes are included,

receiving a request for a hardware address of the second node, the request being received as a broadcast from the first node; and

sending, to the first node, a response to the request, the response comprising a hardware address of the computer and a network address of the second node, thereby enabling the first node to communicate with the second node as if the first and second nodes are on the same segment of the network.

2. A computer-readable medium having stored thereon computer-executable instructions for performing the method of claim 1.

3. The method of claim 1 wherein the request includes a network address of the second node and, at the computer in communication with the first and second nodes, the hardware address of the computer of the second node is determined from a data structure comprising network addresses and their corresponding hardware address.

4. The method of claim 1 wherein the request includes a network address of the second node and, at the computer in communication with the first and second nodes, the hardware address of the second node is determined by modifying the request received from the first node to include a hardware address of the computer and relaying the modified request over at least the segment including the second node.

5. The method of claim 4 wherein the second node responds to the computer with the hardware address of the second node.

6. The method of claim 1 wherein at least one segment of the plurality of segments comprises a wireless link.

7. The method of claim 1 wherein the respective segments for the first computer and second computer are different types.

8. The method of claim 1 wherein the request for the hardware address is an ARP request.

9. The method of claim 1 wherein the second node has a network interface and the hardware address of the second node is a MAC address, the MAC address being stored in the network interface.

10. The method of claim 1 wherein the first node maintains a data structure, the data structure mapping IP addresses of network nodes to their respective hardware address and wherein, after receiving the response from the computer, the first node updates the data structure to map the network address of the second node to the hardware address of the computer.

11. A method of facilitating communication between nodes on different segments of a network, the method comprising:

at an intermediate computer linked to a first network segment and a second network segment,

receiving an ARP message from a first computer on the first network segment, the ARP message comprising a source MAC address and a first source IP address, the first source IP address having the value of an IP address of the first computer;

changing the value of the source MAC address in the ARP message from a MAC address of the first computer to a MAC address of the intermediate computer to create a modified ARP message;

transmitting the modified ARP message over the second network segment;

receiving a response from a second computer on the second network segment, the response comprising a MAC address of the second computer and a second source IP address, the second source IP address having the value of an IP address of the second computer;

changing the value of the MAC address of the response message from a MAC address of the second computer to a MAC address of the intermediate computer to create a modified response message; and

transmitting the modified response message over the first network segment to the first
5 computer to enable the first computer to communicate with the second computer as if the first and second computers are on the same network segment.

12. A computer-readable medium having stored thereon computer-executable instructions for performing the method of claim 11.

13. The method of claim 11, wherein, after receiving the ARP message from the first computer, the source MAC address and the first source IP address are stored in a data structure and wherein the intermediate computer uses the data structure to send a response message to the first computer.

14. The method of claim 13 wherein the data structure is organized as a table.

15. The method of claim 11 wherein at least one of the first and second network segments is a wireless link.

16. The method of claim 11, wherein the intermediate computer has a first network interface linking the intermediate computer to the first network segment and a second

network interface linking the intermediate computer to the second network segment and wherein when the intermediate computer changes the source MAC address in the ARP message to a MAC address of the intermediate computer, the MAC address of the intermediate computer corresponding to the second network interface.

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17. The method of claim 16 wherein, when the intermediate computer changes the value of the MAC address of the response message to a MAC address of the intermediate computer, the MAC address of the intermediate computer corresponding to the first network interface.

18. A system for facilitating communication between nodes of different segments of a computer network, the system comprising:

a computer;

at least a first network interface card and a second network interface card coupled to the computer, the first network interface card being linked to a first segment of the computer network and the second network interface card being linked to a second segment of the computer network;

one or more programs executing on the computer for performing the steps of:

receiving a request from a first node of the computer network via the first segment and the first network interface card, wherein the request is for a hardware address of a second node of the computer network, the second node being communicatively linked to the computer via the second segment and the second

network interface card, and wherein the request includes the hardware address of the first node as the source hardware address and the IP address of the first node as the source IP address;

modifying the request by changing the source hardware address to that of the second network interface card while leaving the source IP address unchanged; and transmitting the modified request to the second node via the second network interface card and the second segment.

19. The system of claim 18, wherein the one or more programs executing on the computer further perform steps comprising:

receiving a response to the modified request from the second node via the second segment and the second network interface card, the response including the hardware address of the second node as the source hardware address and the IP address of the second node as the source IP address;

modifying the response by changing the source hardware address to that of the first network interface card while leaving the source IP address unchanged; and

transmitting the modified response to the first node via the first network interface card and the first segment.

20. The system of claim 19, wherein the one or more programs perform further steps comprising:

keeping track of the association between the hardware address of the first node and the IP address of the first node;

keeping track of the association between the hardware address of the second node and the IP address of the second node; and

5 relaying messages between the first and second nodes using the hardware addresses of the first and second network interface cards respectively so as to make it appear to the first and second nodes that they are communicating with one another over a single network segment.